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09/594,467	06/14/2000	Siavash Alamouti	1999-0342 (STG168)	7464
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Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

Application No.

09/594,467

Applicant(s)

ALAMOUTI ET AL.

Examiner

Duc C. Ho

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 02 September 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-30 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 11, 14, 19, 22, 25 and 30 is/are allowed.
- 6) ☒ Claim(s) 1-10, 12, 13, 15-18, 20, 21, 23, 24 and 26-29 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_.
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date: \_\_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_.

## DETAILED ACTION

### *Claim Rejections - 35 USC § 102*

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102(e) that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –  
(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claims 1-8 are rejected under 35 U.S.C. 102(b) as being anticipated by Fattouche et al.(US 5,282,222-in record), hereinafter referred as Fattouche.

Regarding claim 1, Fattouche discloses a method and apparatus for multiple access between transceivers in wireless communications using OFDM spread spectrum. The wireless system comprises:

- a wireless base unit (a base station fig. 5b);*
- a plurality of fixed wireless remote units (a plurality of portable receivers fig. 5c);*
- a plurality of wireless voice traffic channels available between the wireless base unit and the plurality of fixed wireless remote units (the N voice channels, fig. 2, see column 7, lines 28-33, fig. 2);*
- a plurality of wireless data traffic channels available between the wireless base unit and the plurality of fixed wireless remote units (see column 7, lines 28-46, and column 17, lines 50-61, fig. 2, fig.13a);*

*each wireless traffic channel being identifiable by a unique combination of frequency and time slots* (each channel is inherently assigned with a combination of a unique time slot and one of contiguous frequency bands, see col. 8, lines 13-20, and col. 7- line 11 to col. 8-line 20);

*each wireless data traffic channel for carrying high speed data in addressed data packets to and from the plurality of fixed wireless remote units* (each transceiver has its own address so that addressed data packets can be transmitted to or received from a transceiver in accordance with packet-switched communications: that is data packets carrying data, and each packet is addressed to a particular receiver, col. 3, lines 20-22.); *and*

*each wireless voice traffic channel being assignable to a voice communication call involving one of the plurality of fixed wireless remote units for carrying voice data of the voice communication call* (see column 7, lines 28-33).

Regarding claim 2, the VCs (voice channels) are dedicated for voice, see column 7, lines 32-38.

Regarding claim 3, since the instant application is silent at how a wireless voice traffic channel is deassignable during a voice communication call, the limitation “a voice channel is deassignable” is interpreted as if that channel is no longer assigned for voice communication.

Fattouche discloses dynamic channel allocation in which a cell is pre-assigned with 144 full duplex voice channels, and some of these channels could be assigned as

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reserved, or idled. Therefore, the system of Fattouche is capable of deassigned or re-assigned a voice channel during a call for other purposes, see col. 15, lines 46-62.

Regarding claim 4, in OFDM data is transmitted on several RF carriers (or sub-carriers). Therefore, Fattouche discloses data in each unique combination of frequency and time slots comprising a plurality of modulated carriers, see column 8, lines 13-20.

Regarding claim 5, Fattouche discloses a method for use in communicating data in a wireless communication system utilizing OFDM, the method comprises:

*providing a plurality of wireless data traffic channels for carrying high speed data in address data packets, each wireless data traffic channel being identifiable by a unique combination of frequency and time slots* (as suggested by Fattouche a structure and function for transmitting the N voice channels could also be used for data exchange, wherein each channel is inherently assignable with a combination of a unique time slot and one of contiguous frequency bands, see col. 2, lines 3-18, col. 8, lines 13-20, and col. 7- line 11 to col. 8-line 20, and Fig. 2. Therefore, each transceiver has its own address so that addressed data packets can be transmitted to or received from a transceiver in accordance with packet-switched communications: that is data packets carrying data, and each packet is addressed to a particular receiver, col. 3, lines 20-22);

*providing a plurality of wireless voice traffic channels for carrying voice data, each wireless voice traffic channels being identifiable by a unique combination of frequency and time slots, each wireless voice traffic channel being assignable to a voice communication call for carrying voice data of the voice communication call* (for

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the N voice channels, each is inherently assignable with a combination of a unique time slot and one of contiguous frequency bands, col. 8, lines 13-20, and col. 7- line 11 to col. 8-line 20, and Fig. 2).

Regarding claim 6, Fattouche discloses the N wireless voice traffic channels. These channels should be the dedicated ones for voice upon being assigned to carry voice data, see column 7, lines 32-38.

Regarding claim 7, since the instant application is silent at how a wireless voice traffic channel is deassignable during a voice communication call, the limitation "a voice channel is deassignable" is interpreted as if that channel is no longer assigned for voice communication.

Fattouche discloses dynamic channel allocation in which a cell is pre-assigned with 144 full duplex voice channels, and some of these channels could be assigned as reserved, or idled. Therefore, the system of Fattouche is capable of deassigned or re-assigned a voice channel during a call for other purposes, see col. 15, lines 46-62.

Regarding claim 8, Fattouche discloses how the data wireless channels are to be transmitted with unique combination of frequency and time on a plurality of modulated carrier as described in claim 5, see fig.13a, col. 17, lines 50-61.

### ***Claim Rejections - 35 USC § 103***

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and

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the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains.

Patentability shall not be negated by the manner in which the invention was made.

4. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103© and potential 35 U.S.C. 102(f) or (g) prior art under 35 U.S.C. 103(a).

5. Claim 9, 10, 12, 13, 15-18, 20-21, 23-24, and 26-29 are rejected under 35 U.S.C. 103(a) as being unpatentable over Fattouche , in view of McGibney (US 5,889,759).

Regarding claim 9, Fattouche discloses a method and apparatus for multiple access between transceivers in wireless communications using OFDM spread spectrum. In Fattouche, the portable receivers-fig. 5c receive voice communication call signals via the N voice channels, each channel is inherently assignable with a combination of a unique time slot and one of contiguous frequency bands. The voice communication call signals is demodulated by the unit 532-fig 5c, col. 8, lines 13-20, and col. 7- line 11 to col. 8-line 20, and Fig. 2. The portable receivers includes de-processor 528 for applying Fast Fourier transform to the received OFDM signals, and a demod. 532-fig. 5c for demodulating tones for producing voice communication call.

Fattouche, does not clearly disclose

*(1) downconverting the RF OFDM communication signals for producing downconverted OFDM communication signals;*

*(2)sampling the downconverted OFDM communication signals for producing OFDM communication signal samples;*

McGibney discloses OFDM timing and frequency recovery system. In McGibney the terminal includes an IF block 54-fig. 1 for downconverting the OFDM communication signals (corresponding to (1)), and a A/D converter 56-fig. 1 for sampling the downconverted OFDM communication signals, see col. 2, lines 52-62(corresponding to (2)).

It would have been obvious to one of ordinary skill in the art, at the time invention was made, to employ an IF downconverter and a A/D converter as taught by McGibney into a portable receiver of Fattouche so that when OFDM signals transmitted from a base station being received at the portable terminal, the OFDM signals will be downconverted for de- RF mixing, a reversed process to undo what the upconverter did at the base station for transmitting the OFDM signals.

Regarding claim 10, as suggested by Fattouche a structure and function for transmitting the N voice channels could also be used for data exchange, wherein each channel is inherently assignable with a combination of a unique time slot and one of contiguous frequency bands, see col. 2, lines 3-18, col. 8, lines 13-20, and col. 7- line 11 to col. 8-line 20, and Fig. 2. Therefore, each transceiver has its own address so that addressed data packets can be transmitted to or received from a transceiver in accordance with packet-switched communications: that is data packets carrying data, and each packet is addressed to a particular receiver, col. 3, lines 20-22. The addressed data packets are applied to the de-processor 528, and demodulating the



packets by the demod. 532-fig. 5c for producing high-speed data in addressed data packets.

Regarding claim 12, in Fattouche, the demod./decoder 532 inherently comprises a step of producing encoded and compressed data, see column 9, lines 21-48.

Regarding claim 13, in Fattouche the unit 532-fig.5c inherently performs decoding the encoded and compressed data, and decompressing the compressed data that has been generated from the vocoder 510-fig. 5b.

Regarding claim 15, Fattouche discloses a method and apparatus for multiple access between transceivers in wireless communications using OFDM spread spectrum, the method comprises:

*for each frequency/time slot combination associated with voice traffic channel:*

*modulating* (the unit 512-fig. 5b performs modulating speech signals) *a plurality of tones with voice data of a voice communication call that is assigned to the voice traffic channel* (the base station –fig. 5b is capable of transmitting speech signals in the N voice channels, wherein each channel is inherently assignable with a combination of a unique time slot and one of contiguous frequency bands for voice traffic channel, col. 8, lines 13-20, and col. 7- line 11 to col. 8-line 20, and Fig. 2);

*applying an Inverse Fast Fourier Transform (IFFT) to the plurality of modulated tones for producing OFDM communication signal samples* (The processor 514 applies IFFT to the modulated tones, column 10, lines 25-27);

*transmitting the RF OFDM communication signals over the voice traffic channel* (the OFDM signals is transmitted over voice channels by the antenna 520-fig. 5b).

Fattouche, however, does not clearly disclose (1) converting the OFDM communication samples to OFDM communication signals, and (2) upconverting the OFDM communication signals for producing radio frequency (RF) OFDM communication signals.

McGibney discloses OFDM timing and frequency recovery system. In McGibney the base station includes a D/A 14-fig. 1 (corresponding to (1)), and an IF block 16-fig. 1 for upconverting the OFDM communication signals, see col. 2, lines 41-52 (corresponding to (2)).

It would have been obvious to one of ordinary skill in the art, at the time invention was made, to employ a D/A, and an IF upconverter as taught by McGibney into the system of Fattouche so that voice signals to be transmitted from a base station would be converted from OFDM samples to OFDM communication signals, and mixed in accordance with OFDM principles for producing a good quality voice communication signals and enabling the system's capacity to accommodate more channels.

Regarding claim 16, as suggested by Fattouche, a structure and function for transmitting the N voice channels could also be used for data exchange, wherein each channel is inherently assignable with a combination of a unique time slot and one of contiguous frequency bands, see col. 2, lines 3-18, col. 8, lines 13-20, and col. 7- line 11 to col. 8-line 20, and Fig. 2. Therefore, each transceiver has its own address so that addressed data packets can be transmitted to or received from a transceiver in accordance with packet-switched communications: that is data packets carrying data, and each packet is addressed to a particular receiver, col. 3, lines 20-22. The addressed data packets are modulated by the Mod. 512-fig. 5b; the processor 514-fig. 5b applies an IFFT to the plurality of tones for producing OFDM communication signal samples; the converting step of converting the OFDM communication signals samples

to OFDM communication signals performed by the D/A 14-fig. 1 of McGibney, and upconverting the OFDM signals is performed by the IF 16-fig. 1 of McGibney.

Regarding claim 17, Fattouche further discloses modulating a plurality of tones comprises modulating a phase and amplitude of each one of the plurality of modulated tones, see column 7, lines 19-27.

Regarding claim 18, Fattouche discloses:

*compressing the voice data for producing compressed voice data ( the vocoder 510-fig. 5b inherently performs compressing the voice data for producing compressed voice data, see column 17, lines 52-56);*

*prior to compressing, encoding the compressed voice data for producing encoded and compressed voice data (the vocoder 510-fig. 5b inherently performs encoding the compressed voice data prior to compressing, see column 17, lines 52-56);*  
*and*

*wherein modulating the plurality of tones comprises modulating a phase and amplitude of each one of the plurality of modulated tones with the encoded and compress voice data (in OFDM modulating the plurality of tones comprises modulating a phase and amplitude of each one of the plurality of modulated tones, see column 7, lines 19-27).*

Regarding claim 20, Fattouche discloses a method and apparatus for multiple access between transceivers in wireless communications using OFDM spread spectrum. The portable receiver-fig 5c is operative to receive voice traffic channel. The voice communication call in each voice traffic channel is inherently assigned with a combination of a unique time slot and one of contiguous frequency bands, see col. 8, lines 13-20, and col. 7- line 11 to col. 8-line 20. Fattouche also discloses a de-

processor 528-fig. 5c for applying FFT to the received signals, and demod/decoder 532-fig. 5c.

Fattouch, however, does not clearly disclose (1) a receiver front end, and (2) a radio frequency downconverter, and an A/D converter.

McGibney discloses a terminal 40 comprising a RF front end 52-fig. 1, col. 2, lines 53-62 (corresponding to (1)); a IF downconverter 54-fig. 1 (corresponding to (2)); and a A/D 56-fig. 1 (corresponding to (3)).

It would have been obvious to one of ordinary skill in the art, at the time invention was made, to employ an RF front end, an IF downconverter, and a A/D converter as taught by McGibney into the receiver of Fattouche in such a way to provide power, and low noise amplifier, de-RF mixer, and downconverting OFDM communication signals into OFDM communication signal samples in order to provide a good quality voice communication signals and enable the system's capacity to accommodate more channels.

Regarding claim 21, this claim has similar limitations as claim 10. Therefore, they are rejected under Fattouche-McGibney-Seki for the same reasons set forth in the rejection of claim 21.

Regarding claims 23-24, these claims have similar limitations as claims 12-13. Therefore, they are rejected under Fattouch-McGibney-Seki for the same reasons set forth in the rejection of claims 12-13.

Regarding claim 26, Fattouche discloses a method and apparatus for multiple access between transceivers in wireless communications using OFDM spread spectrum.

*a modulator (a modulator 512-fig. 5b, see col. 9, lines 21-28), said modulator operative to modulate a plurality of tones with voice data of a voice communication call*

*for each frequency/time slot combination associated with a voice traffic channel that is assigned to the voice communication call (Fig. 5b, column 9, lines 26-33);*

*an IFFT processor (514-fig. 5b), said IFFT processor operative to apply an IFFT to the plurality of modulated tones for each frequency/time slot combination associated with the voice traffic channel for producing OFDM communication signal samples (see also fig 6a, column 10, lines 25-27);*

Fattouch, however, does not clearly disclose (1) a D/A converter, (2) a radio frequency upconverter, and (3) a transmitter front end.

McGibney discloses a base station 10-fig.1 comprising a D/A converter 14, col. 2, lines 40-52 (corresponding to (1)); an IF upconverter 16-fig. 1 (corresponding to (2)); and a transmitter front end 18-fig. 1 (corresponding to (3)).

It would have been obvious to one of ordinary skill in the art, at the time invention was made, to employ a D/A converter, an RF upconverter, and a transmitter front end as taught by McGibney into the base station of Fattouche in such a way to provide power, and low noise amplifier, RF mixers, and converting OFDM signal samples into OFDM communication signals in accordance with OFDM principles in order to provide a good quality voice communication signals and enable the system's capacity to accommodate more channels.

Regarding claims 27-29, these claims have similar limitations as claims 16-18. Therefore, they are rejected under Fattouche-McGibney for the same reasons set forth in the rejection of claims 16-18.

***Allowable Subject Matter***

6. Claims 11, 14, 19, 22, 25, and 30 are allowed.

**Conclusion**

7. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Duc Ho whose telephone number is (571) 272-3147. The examiner can normally be reached on Monday through Friday from 7:00 am to 3:30 pm.

If attempt to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Huy Vu, can be reached on (571) 272-3155.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the Group receptionist whose telephone number is (571) 272-2600.

The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

8. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Patent Examiner



Duc Ho

5-27-05